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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,025	06/15/2006	Morio Nishigaki	10873.1908USWO	6550
53148 7590 12/23/2008 HAMRE, SCHUMANN, MUELLER & LARSON P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402				
EXAMINER				
BRUTUS, JOEL F				
ART UNIT		PAPER NUMBER		
3768				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/583,025

**Applicant(s)**

NISHIGAKI ET AL.

**Examiner**

JOEL F. BRUTUS

**Art Unit**

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CI/CC)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 6/15/2006

### DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hassler (US Pat: 4,218,768) in view of Ito et al (Pub. No.: US 2002/0057540) and further in view of Kodera et al (US Pat: 4,451,909).

Regarding claims 1-5, 7-8, Hassler et al teaches a plurality of transducers and transducer elements for to transmit and receive ultrasonic energy that is pertinent to the claimed invention. Hassler further teaches an apparatus for ultrasonic scanning comprising an ultrasonic applicator consisting of a plurality of transducer elements spatially adjacently arranged in a surface and a control device which effects a connection of a number of ultrasonic transducers, signal transmitter or signal receiver [see column 1 lines 15-30]. A matrix of 3x80 transducer elements with a 3x80 switching members, transmit switches and receive switches, transmit mode, receive mode [see column 3 lines 10-20 and figs 1-3]; input switches of buffer amplifiers that may be operated each as voltage-controlled current source [see column 6 lines 13-18]. Hassler further teaches 3x10 individual transducers, a channel of change over switches [see column 16 lines 26-29]; and MOS circuit [see column 15 lines 57-58].

Hassler doesn't teach power regeneration switch and capacitors.

However, Ito et al teaches a semiconductor switching device that can be replaced with a power regeneration switch that comprises a diode having the same forward direction as the first diode and a switching element connected in parallel thereto [see 0035]. Energy stored into a capacitor through the diode of the power regeneration switch is regenerated to the power source through the switching element of the power regeneration switch [see 0035]; a power source [see 0036]; a DC voltage converter is connected to a first capacitor with input terminals thereof and connected to power input terminals of a gate drive circuit with output terminals thereof. Voltage of the first capacitor is regulated by the DC voltage converter and, then, supplied to the gate drive circuit [see 0032]. A second capacitor is connected in parallel to at least one non-linear circuit for supplying gate driving voltage [see 0033]. A DC voltage converter is connected to the second capacitor with input terminals thereof and connected to power input terminals of a gate drive circuit with output terminals thereof. Voltage of the second capacitor is regulated by the DC voltage converter and, then, supplied to the power input terminals of the gate drive circuit [see 0033]. The first capacitor comprises series connected capacitors and each capacitor is connected to the respective non-linear unit in parallel. A DC voltage converter is connected in parallel to one or more capacitors of lower voltage side with input terminals thereof and connected to power input terminals of a gate drive circuit with output terminals thereof. Voltage of said one or more capacitors is regulated by the DC voltage converter and, then, supplied to the power input terminals of the gate drive circuit [see 0034].

Hassler doesn't teach a plurality of generators

However, Kodera et al teaches an ultrasonic wave detection system, first and second pulse generators for generating a transmit/receive signal, an oscillator to generate carrier wave, transmit/receive switch, a switching circuit [see column 3 lines 8-20].

Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to combine these references; for the purpose of stabilizing or regulating the flow of current, to reduce the possibility of cross talks, thus improving the efficiency of the device.

One with ordinary skill in the art would be motivated to use the capacitors in cascade or in parallel; for the purpose of having the same voltage across all the capacitors; and cascade to obtain a total voltage.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hassler (US Pat: 4,218,768) in view of Ito et al (Pub. No.: US 2002/0057540) and further in view of Kodera et al (US Pat: 4,451,909) as applied to claim 1 above, and further in view of Niemi (Pub. No.: 2004/0008094).

Regarding claim 6, all other limitations are taught as set forth by the above combination.

The above combination doesn't teach MEMS as a switch.

However, Nemi teaches an ultrasonic device with the possibility of using MEMS as switch.

Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to combine these references; for the purpose of having the luxury to implement the switch in any small configuration since MEMS is so small; thereby saving space.

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Fri 7:30 AM to 5:00 PM (Off alternative Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./  
Examiner, Art Unit 3768

/Long V Le/  
Supervisory Patent Examiner, Art Unit 3768